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# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Virus Debris

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A SCIENCE SERVICE PUBLICATION

## GENETICS

# Chromosomes Now Seen

Achievement resulted from new technique for smashing viruses in electron microscope and photographing the debris. Work done with bacteriophage.

## See Front Cover

► STRANDS OF the heredity-inducing chemical, or "chromosomes," of a virus have now been seen and positively identified with the virus it came from for the first time.

This achievement was made possible by the freeze-drying technique for smashing viruses in the electron microscope and photographing the sub-microscopic debris developed by Drs. Robley C. Williams and Dean Fraser of the University of California.

The virus they worked with is a bacteriophage, a virus which infects bacteria.

"Bacteriophage 'chromosomes' are known to be almost pure desoxyribose nucleic acid, or DNA," said the biophysicists. "Nucleic acid is implicitly involved in determining the heredity of every living thing, and we believe that DNA is entirely responsible for the replication (duplication of structures as in genetic processes within the cell) of bacteriophage inside the bacterium. Therefore, we were extremely anxious to examine this substance as it comes from the virus and without chemical extraction and

purification."

The ghost of a T<sub>8</sub> bacteriophage is shown in the picture on the front cover of this week's SCIENCE NEWS LETTER. It is on the right of the picture which was taken by Drs. Williams and Fraser. The "ghost" is the protein outer coat of the virus and the fibril strands of nucleic acid (DNA), which came from the particle when it was smashed, are scattered to the left. The sandpaper-like background is the collodion film on which the virus rests, as it appears under very high magnification. The large, black spot to the right of the "ghost" is just a pit in the film.

The scientists explained that other methods of preparing DNA for study usually result in elongate (polymerized) fibril strands of the substance or broken fragments of DNA "molecules." The researchers reported their determinations of the physical character of virus DNA strands in agreement with other methods for physical analysis of the substance.

Drs. Williams and Fraser report their work in the *Proceedings of the National Academy of Sciences*.

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## PHYSIOLOGY

# Spurs to Immunity

► DISCOVERY OF two chemical spurs to one of the body's important protective mechanisms was announced by Dr. John H. Heller of the Yale School of Medicine, New Haven, Conn., at the meeting of the International Physiological Congress in Montreal, Canada.

The two chemical spurs are vitamin B-12, known as the anti-anemia vitamin, and choline, which prevents fat from being deposited in the liver.

The protective mechanism they spur, or stimulate, is called the RES, short for reticulo-endothelial system. The RES was discovered about 30 years ago, but is still one of the least known systems in the body. RES cells are found throughout the body with a heavy concentration in the liver and spleen.

What little is known about the RES points to its playing a critical part in maintaining good health. Some of the clues about its unknown functions give hope that it may be the key to treating many serious diseases such as cancer and heart disease.

The RES is known to help produce the

antibodies that fight disease germs, and gamma globulin now being used to fight polio. It seems to be important in helping to protect healthy tissue against radiation sickness, including that from atom bombs. And an important connection between the RES and cancer is known to exist though the exact relation has not yet been determined.

The experiments reported by Dr. Heller showed that when the RES had been depressed to below normal function in laboratory animals, an injection of choline or vitamin B-12 restored it to normal.

The fact that the RES was being stimulated could be determined by a method developed by Dr. Elemer Gabrieli of the Yale group. This method gives the first one scientists have had for accurately measuring the RES or telling whether it was being depressed or stimulated.

Dr. Gabrieli used for his test radioactive phosphorus made in the atomic pile at Oak Ridge, Tenn. This radioactive, or tagged, phosphorus is injected into the blood stream. The RES and only the RES will immediately pick up this radioactive chemi-

cal and remove it from the blood.

Before and after blood tests show how fast it is doing the job. If the rate is above normal, the RES is being stimulated. If it is slower than normal, the RES is not functioning properly.

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## OCEANOGRAPHY

## Discover Large Basin Under Water Off Mexico

► DISCOVERY OF an 8,400-foot deep basin six miles long and two miles wide on the floor of the Pacific ocean off the west coast of Mexico has been reported by the University of Southern California.

Covering an area of 1,500 square miles, larger than the state of Rhode Island, the newly-surveyed area was named the Velero Basin because it was found from the research ship Velero IV, operated by the Allan Hancock Foundation for Scientific Research.

Dr. Kenneth O. Emery, professor of geology, conducted the survey as a field trip of his oceanography class last year. His findings are reported in the *American Journal of Science* (Sept.). Graduate students participating in the work were R. E. Arnal, B. L. Conrey, W. E. Fortin, J. R. Grady, W. H. Hudson, J. W. Marlette, W. Orr, E. Uchupi, and F. C. Ziesenhenn.

The Velero Basin lies about 100 miles off Ensenada, Mexico, between the continental shelf and the coastline, at latitude 31.5 degrees north and longitude 118.5 degrees west.

It is the deepest point of the whole region east of the continental slope and north of that latitude. Its water is different from that of the open sea in that it is nearly the same temperature, 37 degrees Fahrenheit, from a depth of 6,000 feet to the bottom, has almost the same salt content and is of abnormally low oxygen content between 6,000 feet and 8,400 feet.

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## GERONTOLOGY

## "Smart" People Give Psychologists Surprise

► "SMART" PEOPLE get smarter as they grow older. This surprised even the psychologists who tested them.

Another surprise was finding that the two oldest of some 1,200 tested had grown smarter and scored higher than the group averages, even though they were not among the ones selected in 1922 for their "giftedness," or smartness. These two were tested simply because they were married to gifted persons in the original group.

These findings were reported by Dr. Nancy Bayley of the University of California and Dr. Melita H. Oden of Stanford University at the meeting of the Gerontological Society in San Francisco.

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## CHEMISTRY

# New Plastics Coming

New plastics will not be limited to carbon compounds and silicones but will be made from everything from phosphorus to arsenic.

► THE PLASTICS which make so many new materials are by no means limited to the usual carbon compounds and the new silicones in the chemists' bag of tricks.

Possibility of whole new series of them, built of everything from phosphorus to arsenic, appeared in a paper given in Chicago before the American Chemical Society by Dr. Anton B. Burg of the University of Southern California at Los Angeles. Dr. Burg reported work carried on in association with Drs. J. C. Taylor, D. K. Robinson, C. L. Randolph Jr., R. I. Wagner and F. G. A. Stone of the same institution.

Possibility of making compounds between phosphorus and nitrogen, phosphorus and arsenic, arsenic and boron, and phosphorus and boron are being studied by the group, and the resulting plastic-type materials tested for stability and chemical inertness.

Dr. Malcolm E. Kenney described similar attempts made with Dr. A. W. Laubengayer at Cornell University to produce plastic materials by combining carbon compounds with the little-known metal gallium. Such compounds might be expected to be similar to those made with boron.

## Elements Predicted

Experience with the newest man-made elements leads their discoverer, Dr. Glenn T. Seaborg of the University of California, to predict with greater certainty the chemical properties of eight elements which do not exist today and may never have existed on earth. If they are made at any time in the future, either in the giant cyclotrons of the University of California under Dr. Seaborg's direction, or elsewhere, they will conform to the pattern displayed by the sequence of 98 elements already known, according to Dr. Seaborg's prediction.

Element No. 104 will accordingly be similar in properties to zirconium and hafnium, now in demand as materials for building atomic reactors. Elements 99 to 103 will complete the list of actinide elements, which correspond to the lanthanide, or "rare earth" elements which appear among the fission products of uranium. Uncertainty about this correspondence was expressed by some chemists when the man-made elements first appeared on earth, as a result of neutron bombardment of uranium in atomic piles. Dr. Seaborg now believes that apparent irregularities in the properties of thorium, uranium and the first of the "artificial" elements are understood and that the places of the new elements are well established.

## Complex Sugars Made First

Green leaves seize upon the carbon in the carbon dioxide they absorb from the air and build it into a complex acid composed of phosphorus and glycerine, which is then torn down to make sugar.

This round-about way of building plant nutrients was explained by Drs. James A. Bassham and M. Calvin of the University of California.

Working with radioactive carbon 14, these scientists have made a time chart showing the successive combinations formed as the radioactive material travels through the life processes of the plant. Ordinary sugars which are commonly obtained from plants and fruits are shown by these studies to be late steps in the plant's photosynthesis, while unusual sugars of greater complexity are formed first.

This is the opposite of the way chemists had imagined the build-up of sugar in plants. They had supposed that nature would start with some simple compound and build toward the more complex ones.

## Molds Make Alcohol

New kinds of fermentation have been discovered in which pentose, a simpler kind

of sugar than the one met on the dinner table, is changed to alcohol by molds instead of yeasts. Studies of fermentation by various kinds of molds and bacteria were reported by Dr. Martin Gibbs of the department of biology at Brookhaven National Laboratory. Radioactive carbon was used to determine the formation of fermentation products.

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## PHYSIOLOGY

## Primitive Animals Have Red-Blood Material

► RED BLOOD material has been discovered in very primitive animals, protozoa.

Hemoglobin may be much more widely distributed in this large phyla division of the animal kingdom, Drs. D. Keilin and J. F. Ryley of Cambridge University's Moltano Institute suggest in a report to the British scientific journal, *Nature* (Sept. 5).

They proved spectroscopically that this iron-containing constituent so important in human blood exists in small quantities in *Tetrahymena pyriformis*. In 1937 two Japanese scientists, T. Sato and H. Tamiya found it in *Paramecium caudatum*.

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## ARCHAEOLOGY

## Soup Was on a Thousand Years Ago in New Mexico

► SOUP WAS on some thousands of years ago in what is now New Mexico. The stone bowl and remains of the fire on which it came to a boil have now been found by



**SOUP WAS ON**—Some thousands of years ago, prehistoric Indians cooked dinner in this pot. Here are shown archaeologists carefully digging out the pot and remains of the fire on which it came to a boil so long ago.

archaeologists from the Chicago Natural History Museum under the leadership of Dr. Paul S. Martin.

Discovered with the bowl were some crude figures of bears, a tobacco pipe and about half of a sandstone disk painted in

bright colors. Archaeologists are excited about the find because of what the objects reveal of the lives of prehistoric Americans many hundreds of years before the coming of the white man.

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## MEDICINE

# Specific Virus Antidotes

Prediction made that within five years diseases now incurable will have chemical specifics. Many classes of compounds considered hopeful.

► PREDICTION THAT virus diseases will find their specific antidotes within five years was made in Chicago by members of the world's first symposium on chemical specifics against the disease group for which there is now no cure.

Taking part in the symposium were Dr. Alexander M. Moore, Mellon Institute, Pittsburgh, who presided; Dr. I. W. McLean, Jr., Parke, Davis & Co., Detroit, Mich.; Dr. Laurella McClelland, Merck Institute for Therapeutic Research, Rahway, N. J.; Dr. W. Wilbur Ackermann, School of Public Health, University of Michigan, Ann Arbor, Mich.; and Dr. John Spizizen, department of virology, Sharp & Dohme Division, Merck & Co., West Point, Pa.

Less than 20 classes of compounds are now looked upon as hopeful as the source of such possible specifics against virus diseases, these research people say. But they point out that each class of compounds may offer the chance of finding the most promising drug among many related chemical substances. Five years ago no work was being done on this problem. Today the results so far obtained give hope that study for an equal time in the future may produce practical results.

Pooling their information on how to study virus attack on the living cell, this group, calling themselves "virologists," came to the American Chemical Society's meeting to interest chemists in helping them.

Their hope is to expand the number and kind of chemicals that seem hopeful in their attack on the cause of polio, influenza, and other virus-caused diseases. These diseases still resist the sulfas, the antibiotics and the other so-called miracle drugs which have proved specific against other illnesses. It is the hope of the virologists that some medicines with equal power against virus diseases may be found, either among new antibiotic preparations or as known types of chemical compounds formulated on purpose for trial.

A 50-50 chance exists, in the opinion of this group, that the specifics they hope to find will come from the antibiotic or the strictly chemical classes of remedies. Some signs have already appeared in their searches of compounds that prolong the life of cells under virus attack. There is even

an occasional "cure," although the results are by no means yet predictable enough so that they can be tried in clinical tests on patients.

What happens when a virus breaks through the membrane surrounding a living cell, and how the break-through can be prevented or the virus destroyed before it multiplies and spreads to other cells, make up one line of attack on the virus disease problem. There is plenty of literature, according to the scientists, on things that do not work. They now begin to see hope of finding some that do.

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## BIOLOGY

# Study Germ Genetics For Best Treatment

► BETTER DISEASE fighting will be done when doctors know more about the genetics of disease germs and how this affects the germs' reaction to antibiotics, or so-called mold remedies.

Some of this kind of knowledge was reported by Dr. W. Szybalski of the Biological Laboratory, Cold Spring Harbor, L. I., N. Y., at the meeting of the Sixth International Congress for Microbiology in Rome.

Development of resistant strains of germs is responsible for many failures with penicillin and other antibiotics, as is well known. Such resistance develops because the drug kills off the non-resistant germs, allowing mutants that were born with resistance to develop.

When two antibiotic drugs are given at one time, as is being done more and more, the situation is more complicated. If the drugs are unrelated, the chances are much smaller that a particular single disease germ will be resistant to both. This is the case for the TB fighting drugs, isoniazid and PAS, or para-aminosalicylic acid.

But when the drugs are related, the situation is different. For example, mutants resistant to aureomycin are also resistant to terramycin and the reverse. Such cross resistance is not always reciprocal, however. Mutants may develop which are resistant to erythromycin and also to aureomycin if that is given later, but if aureomycin is

given first, aureomycin-resistant mutants may not be resistant to erythromycin.

Antagonism between drugs also appears when they are given together. This develops when a strongly germ-killing drug is given with a relatively ineffective concentration of a drug that checks germ growth but does not kill the germs.

From his studies, Dr. Szybalski concludes that there is probably a genetic explanation for both positive and negative interaction between anti-germ drugs.

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## BOTANY

# Better Hybrids Possible

**Pollen-sterile plants have now been developed by special breeding. These plants may be used for hybrid production with other desirable plants.**

► **BETTER QUALITY** and bigger yields of onions, beets, carrots, rye, celery, swiss chard and many kinds of flowers will soon be available through a new sterile pollen method of producing hybrid seed.

W. H. Gabelman, University of Wisconsin horticulturist, reported to the American Institute of the Biological Sciences meeting in Madison, Wis., that pollen-sterile plants have been developed by special breeding. They are being used for hybrid production in plants not capable of being detasseled as in the case of corn.

When the seed parent plant develops sterile pollen, as can be caused now in some plants, the male element can be furnished by nearby plants that it is desired to cross-breed to create the bigger and better yields and quality.

The first hybrids by the new method to be available will be sweet corn, onions, beets, carrots and petunia.

Such plants as beans, tomatoes, peppers, peas, lettuce and wheat which are self-pollinated probably will never be hybridized in this way.

From Mexico where corn has been domesticated for thousands of years and ears among 25 distinct races range up to two feet in length, native corn varieties have the chance of contributing their heredity to hybrid corn for the United States more productive and more resistant to drought, disease and insects.

Prof. Paul C. Mangelsdorf of Harvard University reported this prospect. Mexico's agriculture is benefiting from intensive study and development of corn since 1943 by the Rockefeller Foundation and the Mexican government. Some Mexican corn races have been hybridized with a wild grass "teosinte" to produce hardier types that are resistant to drought and disease. This hybrid is especially promising for breeding purposes in the United States.

The growth-regulating chemical, maleic hydrazide, is being used to produce hybrid grain sorghum of superior qualities. Prof. Wayne J. McIlrath, University of Chicago botanist, predicted that if chemically suppressing the male flowers is successful an increase in production of sorghum as great as or greater than the success achieved in hybrid corn should be possible. The chemical sterilizes the pollen of the plant. Sorghum is as important a crop as barley.

Plasters or pastes of needed chemicals can be applied to fruit trees on their trunks and branches to give them food or to remedy nutritional deficiencies, such as zinc and magnesium. The idea of fertilizing

by applications to scraped bark, first used a century and a half ago, has been demonstrated effective in special cases by Drs. R. L. Ticknor, H. B. Tukey and S. H. Wittwer of Michigan State College. Fertilizers can be applied in this way to sick and wounded trees, winter-injured or undernourished, but this method should only supplement regular fertilizer applications to be picked up by the roots.

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## PHYSIOLOGY

## Cancer Patient's Red Blood Cells Different

► **RED BLOOD** cells from cancer patients behave differently in their chemical activity than red blood cells from the normal.

This finding was announced by Drs. Allen F. Reid, Richard C. Gilmore Jr., and Margaret C. Robbins of Southwestern Medical School, University of Texas, Dallas, Tex., at the meeting of the American Chemical Society in Chicago.

It is in the handling of inorganic phosphate that the Texas scientists found the difference between the cancer and normal red blood cells.

Using radioactive phosphorus because it could be traced, they found that the red blood cells from cancer patients lost phosphorus at a faster rate than the cells from normal persons.

The studies suggest that normally there is a substance in the blood which checks the loss of phosphate from the red blood cells, and that cancer patients' blood has much less of this substance. The scientists also think that the red blood cells in cancer patients are more sensitive to standard amounts of this substance than normal red blood cells.

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## PHYSICS

## Physical Reports Forecast In British Publication

► **REPORTS OF** scientific discoveries in physics will be forecast in a new publication of the Physical Society, Britain's organization of physics. Each month a booklet containing abstracts of forthcoming papers is issued. Reprints of the papers can also be secured upon special order.

This new technique supplements the time-honored Proceedings which appear monthly in two sections, one devoted to original papers on nuclear, atomic and molecular physics, and the other to original papers on materials and other phenomena.

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**FOOD FOR MARINES**—This appetizing meal is the new replacement for the old B ration. Far from monotonous, and containing such treats as chocolate cake and peach cobbler, the new ration nevertheless is composed primarily of canned and dehydrated foods, practical for serving in the field. It supplies more than enough vitamins, minerals and calories for an active man.

## MEDICINE

# Enzyme Digests Clots

► **LIFE-THREATENING CLOTS** in the heart's arteries can be dissolved by the digestive enzyme, trypsin. New canals then are formed through the blood vessels, so that blood can get through to nourish the heart muscle.

That this is true in experimentally produced clots in dogs was reported by Drs. C. M. Agress, H. I. Jacobs, W. G. Clark, M. J. Binder and M. Lederer of the Veterans Administration Center and the University of California School of Medicine at Los Angeles at the meeting of the American Society for Pharmacology and Experimental Therapeutics in New Haven.

If the method works as well in humans as in the experimental animals, it may be possible to save many patients threatened

by the kind of heart disease called acute myocardial infarction.

Dr. Agress and associates had previously developed a method of producing in dogs fibrin clots in the heart arteries. Tiny, colored radioactive beads injected into the arteries were used in one part of this study. The heart condition produced was almost identical with that seen in human heart failure.

Injections into the veins of crystalline trypsin (supplied by Armour and Co., Chicago) dissolved the clots. The part of the heart affected by the blood clot was not damaged, the area of damage from the clot was decreased, mortality was reduced and electrocardiographic studies showed improvement in the heart condition.

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## RESOURCES

# Newsprint Still Problem

► **SUPPLY AND** demand of America's newsprint have struck an uneasy balance.

High-speed presses in the United States are hungrily devouring 6,000,000 tons a year as U. S. and Canadian paper mills run at 98% capacity.

Merrill Lord, deputy director of the forest products division of the National Production Authority, told Science Service that the critical, world-wide shortage in early 1951 eased off some in mid-1952. But even so, publishers and newsprint producers are weighing the future against the present.

The ever-expanding demand for newsprint continually casts its shadow over the market, making it desirable to work out reclaiming processes that may come in handy some day.

Deinking newsprint often has been suggested as a possible "out" for a critical shortage. However, deinking processes are expensive and never have been completely satisfactory.

Newsprint is produced for immediate consumption and discard. Because of the swift pace at which newsprint feeds through the public's hands, papermakers do not take the manufacturing care with it that they take with better paper stocks.

Chemical wood pulp, which goes into "slick" magazines, is made of wood chips treated in an alkaline solution. This quality process extracts lignin, a cellulose-like compound, and carbohydrates from the wood. But newsprint, which does not have to be "quality" stock, goes untreated. Left in the newsprint, the lignin later yellows the paper with heat, light and age.

When used newsprint is funneled through vats in deinking mills, chemicals act upon the lignin, turning it dark brown.

Because of this, deinked newsprint is not cheaply recovered.

To be made suitable again for the nation's daily presses, the reclaimed pulp must be treated with chemicals that bleach away the objectionable stain.

Some deinked magazine paper has been reclaimed for newspaper use. But on the whole, papermakers find it cheaper to turn out fresh paper than to process used stock.

However, Mr. Lord believes that enough scientific brainpower exists to produce a "winner" deinking process—one that is economical and easy to manage. Work now is in progress to develop processes that circumvent the drawbacks of present methods, he said.

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## AERONAUTICS

# Radar Device Apes "Little Sir Echo"

► **IF NICKNAMES** are appropriate to electronics equipment, "Little Sir Echo" should closely describe a new radar safety beacon now being discussed in aviation circles in Washington.

The device is designed to be carried by airplanes. When an airport-based radar scans the plane, the radar beam will trigger the beacon and it will send back a coded "echo."

In effect, this strong "echo" will take the place of the regular reflected radar signal which, at the ground station, often is extremely weak. The new equipment was conceived to get around these weak, sometimes completely missing, reflected signals.

Promoted by the Radio Technical Commission for Aeronautics, the radar safety

beacon will improve reliability of the airport's radar traffic control system, give positive identification of the aircraft through the coded "echo" and permit faster movement of air traffic.

The new equipment has a working range up to 200 nautical miles, or about 230 miles, from the airport's radar transmitter. An airplane entering the search radar field at this point can be identified and tracked to within one mile of the airport.

When the airplane enters the radar range, the airport will assign it one of 10 codes to use until it lands. Its assigned code thus will permit instant identification of the plane should radar contact be interrupted.

The plane's "echo" actually consists of two pulsed radio signals sent back to the ground. The time lapse between pulses can be varied to yield the 10 codes.

The radar safety beacon currently is in the "talk" stage. The RTCA said that it is up to each airline and the Air Force to write their own specifications and to contract individually with manufacturers.

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## TOXICOLOGY

# Exercise Increases Drug Paralysis

► **THE PARALYZING** effect of certain drugs, including perhaps the nerve gases, is "potentiated," or increased by exercise.

Experiments showing this were reported by Drs. Bernard P. McNamara and J. Henry Wills of the Chemical Corps Medical Laboratories, Army Chemical Center, Md., at the meeting of the American Society for Pharmacology and Experimental Therapeutics in New Haven, Conn.

The drugs they reported on are: d-Tubocurarine from the old Indian arrow poison plant; DFP, short for diisopropyl fluorophosphate, made originally as a possible nerve poison and used in treatment of the eye disease, glaucoma; and sodium arsenite, known to many as an insecticide.

These chemicals act to block the transmission of nerve impulses to muscles. Amounts of them that could completely block the nerve to muscle impulse in a nerve muscle preparation that had already been stimulated, as by exercise, did not noticeably affect a preparation that had not been stimulated or had been resting.

In their studies of how nerve muscle impulses are blocked, the scientists also tested chemicals formed when the body digests sugars and starches, and chemicals related to these. Compounds which blocked nerve to muscle impulses or action of the nerve chemical, acetylcholine, included glutarate, alpha-keto-glutarate, glutamate, maleate, fumarate, alanine, acetone, acetoacetate, oxalacetate, isobutyraldehyde and sodium arsenite. Little effect was produced by glucose, citrate, succinate, acetate, lactate, levulose, malate, malonate pyruvate, formate and adipate. The nerve muscle blocking compounds acted first on the nerve and then on the muscle itself.

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## BACTERIOLOGY

# "Harmless" Germ a Killer

Violet germ, long thought to be innocent, now found guilty of killing by serious infections. Prompt, energetic treatment with antibiotics found to be the remedy.

► MURDER MYSTERY fans, and perhaps the writers, should like this one: It might be called the Story of the Violet Germ, Or How a Presumably Harmless Bacterium Turned Killer.

The idea comes from a report by four physicians of the fatal infection of a British army officer with a germ called *Chromobacterium violaceum*. The name comes from the fact that the germ, or bacterium, produces a violet color when grown in cultures in the laboratory.

For the murder mystery fans there is also the fact that this germ produces deadly hydrogen cyanide. The bitter almond smell of this gas may be a clue to the true identity of the germ in case a particular strain loses its ability to produce its identifying color.

The medical report is by Drs. P. H. A. Sneath, R. Bhagwan Singh, J. P. F. Whelan and D. Edwards of the British Military Hospital, Kinrara, and the Institute for Medical Research, Kuala Lumpur. It appears in an English journal for physicians, the *Lancet* (Aug. 8).

The germ of the violet color is commonly found in water and soil and is generally held to be a harmless organism living on dead or decaying matter. First record of its being a killer came in 1904 when Dr. P. G. Woolley found it guilty of killing three buffaloes in the Philippine Islands.

Since then 13 human cases, almost all from the tropics, have been reported. Only two of these are known to have recovered, with records lacking on three others. The British army officer was among those who died of the infection. In his case amebic liver infection was suspected and he was treated with emetine, standard drug for amebic infections, and with the antibiotic, aureomycin, and the anti-malaria drug, chloroquine.

His condition improved and the drugs were stopped. Then he relapsed and was again given emetine and chloroquine.

The day before he died greenish pus was drawn from his liver. No amebas were found but the supposedly harmless, violet-color-producing bacterium was found and identified as the killer.

Tests with this bacterium later showed that it is sensitive to streptomycin, chloramphenicol, aureomycin and terramycin but not to penicillin or sulfadiazine. The officer's improvement, believed at the time due to the emetine, evidently was due to the aureomycin. This, the doctors point out, shows the danger of giving more than one drug at a time.

"Energetic treatment with antibiotics" when the diagnosis can be made in time is advised by the four doctors in their report.

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**GULF STREAM FLOW**—Dr. Gunther K. Wertheim, research associate of the Woods Hole Oceanographic Institution, with the electrode used to record the electrical potential produced in a submarine cable by the flow of Gulf Stream water through the earth's magnetic field.

## OCEANOGRAPHY

## Measure Flow of Florida Current

► YEAR-ROUND FLUCTUATIONS in the Florida Current, an important branch of the Gulf Stream, have been measured by electromagnetic induction involving a telegraph cable linking Key West and Havana.

The measurements, conducted by scientists of the Woods Hole Oceanographic Institution in Massachusetts, reveal that every second an amount of water equal to 100,000,000 brimming bathtubs moves through the Straits of Florida.

The current flow is tied in with meteorological conditions and is somewhat erratic over short periods. But in general, the maximum occurred at the end of April, when 39,000,000 cubic meters of water flowed past the submerged cable each second. Water moved at its slowest speeds from late August to mid-October, 1952, and in March of this year.

Special electrodes were set out near the shore, and were connected to the telegraph cable to measure the electric potential generated in the cable by the water as it moved through the earth's magnetic field. This method proved superior to previous techniques that frequently involved the difficult task of anchoring a ship in deep water.

Science News Letter, September 19, 1953

Leaves are covered with a thin, cellophane-like film less than 1/5,000 of an inch thick.

## PHYSICS

# Supersonic Vortex Tube

► SCIENTISTS IN the physics department of Cornell Aeronautical Laboratory, Inc., at Buffalo, N. Y., may be on the trail of a new instrument that will play a big role in supersonic research.

The instrument is a vortex tube. It measures the temperature of air around an airplane. It compensates for the "ram heating" of air and, in tests, gave temperature readings accurate to within one degree Centigrade.

The vortex tube is an extremely simple device. It has no moving parts. A heat-sensing element inside produces direct temperature readings for the scientists.

Conventional vortex tubes separate an air stream into a cold and a warm air stream at lower pressure. The modified tube used, however, does not actually separate the cold from the warm air. Instead, it keeps a stable core of cold air inside the tube. This core of air yields the temperature of the "free" air around the plane.

At 600 miles an hour, a plane flying just above ocean waves may be warmed 30 degrees Centigrade around its wings and tail because of the heat released by compressed air. At supersonic speeds the heating rises sharply. Now that the so-called "sonic barrier" has been cracked, many aeronautical scientists are hotly pursuing a solution to the "thermal barrier" problem.

"Supersonic heat" has become imposing at speeds flown by supersonic research aircraft today. Great refrigerating systems have been installed in some of the planes to keep their pilots from "frying."

The vortex tube some day may prove valuable as an instrument needed to help scientists chill the effect of the thermal barrier. Scientists at Cornell, however, point out they still must learn how the tube works under supersonic conditions, how it is affected by icing and altitude changes, and how it should be mounted on airplanes.

Science News Letter, September 19, 1953

## ENGINEERING

**Steam Log Carriage Yields to Electricity**

► THE TRUSTY old steam log carriage, which veteran woodsmen have watched for scores of years as it fed logs to the rip-saw, has just about reached the "end of its trail."

H. A. Rose, Westinghouse electrical engineer, told the American Institute of Electrical Engineers meeting in Vancouver, B. C., that today's technology has made electrically driven log carriages cheaper to operate than the steam ones.

The hard-working sawmill machine "has been the last to resist electrification," Mr. Rose went on. This, he explained, is because waste wood has been cheap in the past. But today, the scrap is going into pulp or other highly valued products, and thus is scarce as a low-cost fuel for steam carriages.

Furthermore, steam plants have become costly to install and expensive to operate, except in some of the largest mills where many machines rely upon steam for power.

Science News Letter, September 19, 1953

## MEDICINE

**Lou Gehrig Disease Study Started on Guam**

► THE BAFFLING disease that killed baseball hero Lou Gehrig and attacks 1,500 to 2,500 persons in the United States yearly is now getting a thorough research investigation on the Pacific island of Guam.

The disease is known to doctors as amyotrophic lateral sclerosis, or a.l.s. for short. Natives on Guam call it lytico, short for paralytico.

A.l.s. is said to be highly prevalent on the Pacific island, which is why it was chosen for research in a joint program by the Public Health Service, the Navy's Bureau of Medicine and Surgery, the Department of the Interior and the Government of Guam.

The disease has been prevalent on Guam for generations, Dr. Donald R. Koerner of Rochester, N. Y., found while serving as a Navy physician on the island. This finding plus the fact that the population is relatively fixed will give the scientists a good chance to determine the possible roles of heredity and environment in the development of a.l.s.

Dr. Leonard T. Kurland of the Public Health Service's National Institute of Neurological Diseases and Blindness is now on his way to Guam to head the study. Dr. Donald Mulder, U. S. Navy, and Drs. K. K. Waering and S. Tillema of the Government of Guam will cooperate.

A.l.s. is a degenerative disease of the nervous system in which the fatty covering of nerve fibers of brain and spinal cord are broken down. It therefore belongs to the large class of diseases of which multiple sclerosis is the best known.

Two types of a.l.s. are known: a slow progressive type primarily paralyzing muscles of hands and arms but eventually affecting other parts of the body too, and a more rapidly progressive type where shoulders, neck, tongue, lips, palate and pharynx are first involved and paralyzed. In this latter type death by asphyxia or pneumonia usually occurs within two years.

No treatment is known for a.l.s. It is always fatal and its cause is unknown. Victims are most often between the ages of 30 and 55. The average patient has three years to live after being attacked by a.l.s.

Science News Letter, September 19, 1953

## AERONAUTICS

**Personal Plane Takes Off At Trot; Flies at Gallop**

► A FOUR-SEATER "personal-type" airplane has been designed that takes off at a trot, flies at a gallop and lands at a slow walk.

Fully loaded, the Helio Courier can lift itself into still air in about 220 feet. It will clear a 50-foot obstacle 500 feet from its starting point. It can cruise at 157 miles an hour and land on a still day at 34 miles an hour.

The plane currently is being made by the Helio Aircraft Corporation for the armed services. Company officials say an all-metal model probably will be available to civilians in 1954.

Science News Letter, September 19, 1953

## CHEMISTRY

**Plastic Better Than Wood Now Made Fire Resistant**

► GLASS REINFORCED plastic that surpasses wood in structural strength and can be used in more slender and more graceful structures can now be made safer against fire.

Flammability of polyester resins which increases with reduction in thickness can be overcome by making a chemical change in the resin. Addition of chlorine to the chemical make-up of the resin solved the fireproofing problem, after experimental addition of other kinds of fireproofing materials had resulted in spoiling the plastic's unusual strength.

Solution of the difficulty was reported to the American Chemical Society's division interested in paint, plastics and printing ink, by Drs. P. Robitschek and C. Thomas Bean of the Hooker Electrochemical Co., Niagara Falls, N. Y.

The new fireproof plastic is made from phthalic anhydride by addition of four chlorine atoms. The glass fibers incorporated in the plastic can add their strength to the delicate structure without the danger of fire from the bonding material. Other types of resin are also being improved in flame resistance by similar chemical rearrangement.

Science News Letter, September 19, 1953

**IN SCIENCE**

## MEDICINE

**Diet With Treatment To Fight Cancer**

► PATIENTS GETTING X-rays or chemicals for cancer treatment may some day also be put on special diets.

Studies both here and abroad point to this as a future possibility, Dr. Albert Tannenbaum, director of cancer research in the Michael Reese Hospital, Chicago, told members of the American Chemical Society.

Attempts to starve cancer to death have so far failed, he said. Cancers grow at the expense of the host when the diet is so poor that the body loses weight and poor nutritional state results.

Underfeeding, with restriction of calories, slows the establishment and growth of transplanted cancer in experimental animals and sometimes checks the spread of such cancers. But at best, Dr. Tannenbaum said, the life span of the animals is only moderately increased by limiting the calories.

"Rather interesting results," he said, have been obtained by combining special diets with X-ray treatment or with anti-cancer drugs such as aminostilbene. The diets have been ones with restrictions of either calories or protein or vitamins or minerals.

Giving anti-folic acid chemicals to produce a chronic deficiency of this vitamin have produced results which "may have practical significance," he said. But he stressed that these results are for "particular tumor types" and not for cancers in general.

Science News Letter, September 19, 1953

## CHEMISTRY

**Soap and Water Not Good Germ Killers**

► ORDINARY SOAPS are not germ-killing but if they contain free fatty acids, chemicals uncombined into soap, they can hand a number of bacteria a wallop.

J. V. Karabinos and H. J. Ferlin of the Blockson Chemical Co., Joliet, Ill., told the American Chemical Society in Chicago that a good scrubbing with ordinary soap and water can not be counted upon to kill harmful microorganisms.

The fatty acid in the soap causes a type of suffocation, coating the bacteria with their molecules. This is the theory of its action, and quaternary ammonium compounds, commonly used as germicides, are thought to act the same way.

Cleaning operations that can be carried in a solution that is acid in reaction can be made germicidal by very small quantities of fatty acids with nine to 12 carbon atoms in straight chains, with the 11 carbon fatty acid most efficient.

Science News Letter, September 19, 1953



# SCIENCE FIELDS

## CHEMISTRY

### Drying of Paints Speeded by Chemicals

► A NEW way of making paints, varnishes and inks dry faster is to put into their linseed oil inexpensive amine chemicals along with manganese, iron and other metals that have proved to speed the drying process.

Reported by Raymond R. Myers and Dr. Albert C. Zettlemoyer of Lehigh University and the National Printing Ink Research Institute, the new procedure depends upon keeping out of the materials cobalt metal or compounds which heretofore have been used to accelerate or catalyze drying reactions.

The Lehigh chemists told the American Chemical Society meeting in Chicago that cobalt, although a conventional drying agent, must be excluded from the oil to allow the amines and the manganese and iron to work to the best advantage.

Drying of oil paint and ink is an oxidation process speeded by complex iron compounds such as iron containing hemoglobin acts in the blood.

Science News Letter, September 19, 1953

## TECHNOLOGY

### Additives May Extend Life of Automobile Oils

► SCIENTISTS AT the Canadian National Research Council in Ottawa have found that adding certain chemicals and metals to automobile oil will greatly extend its life.

To the motorist this means that he may not have to change oil every 1,000 miles, but may be able to use the same oil for nearly 7,000 miles.

Tests run on two vehicles showed the additives seem to hold great promise. However, the Council cautions that more extensive tests should be made before sweeping conclusions are drawn.

Laboratory work over a number of years has revealed that the addition of lithium, sodium, potassium, magnesium or their salts or oxides, in certain quantities, has the effect of braking the oxidation that gradually destroys the properties of ordinary hydrocarbon oil.

Although no commercial applications of this discovery have been developed as yet, the National Research Council suggests that a piece of the required metal could be attached inside the motor car's oil plug, or that the protective material could be built into the oil filter.

Dr. I. E. Puddington and Dr. A. F. Sirianni, who developed the formula, also

found a new sand-based, high-temperature, water-repelling grease that may be of particular value to military trucks, jet planes and high speed factory machines. To make the grease water repellent, they added a drying oil. When the mixture is heated, the drying oil forms a water-repelling protective coating over the grease surface.

Both formulas have been patented by the Canadian National Research Council and will be available for commercial development by industry, with the two scientists receiving a small percentage of the royalties.

Science News Letter, September 19, 1953

## TECHNOLOGY

### "Bloody" Model Helps Navy Teach First Aid

► "BLEEDING" FROM any one of half a dozen serious "wounds," a life-size and fully clothed plastic manikin challenges Naval dental officers learning to give emergency treatment to casualties in case of mass disasters.

The "blood" which gives the realistic touch is a fluid of glycerin, water and a red vegetable dye. It is pumped from a storage tank in the base of the manikin to simulate wounds in arm, leg, belly and chest. It drips from the mouth in case the "wound" was a broken jaw.

To make the model as life-like as possible, it was given "skin" of resilient vinyl plastic cured by dry heat in metal molds.

It can also be made to "choke" to simulate a casualty with a foreign body in its throat.

Comdr. John Victor Niiranen of the Navy's Dental Corps, other staff members of the Naval Dental School, and William C. Young, a civilian employee of the audiovisual department at the Naval Medical School, designed the model as a training aid. It was fabricated by Rogay Models of Washington and is currently on exhibit at the Naval Medical Center at nearby Bethesda, Md.

Science News Letter, September 19, 1953

## PLANT PATHOLOGY

### Mold Remedies Stop Plant Diseases, Too

► THE ANTIBIOTICS, so-called mold remedies, that stop germ infections in humans can stop some germ diseases of plants, too.

Fireblight of pears and apples and halo blight of beans, both previously incurable, have been controlled by such antibiotics as terramycin and streptomycin.

For best results, the antibiotic should be applied to the stems of plants, whence it will spread upward and outward through the plant's circulatory system, it appears from studies reported by Dr. John W. Mitchell of the U. S. Department of Agriculture at the American Institute of Biological Sciences in Madison, Wis.

Science News Letter, September 19, 1953

## PHYSIOLOGY

### Bigger Persons Stand X- and Atom Rays Better

► THE BIGGER you are, the better you can stand radiation, from X-rays to atom bombs. This appears from studies by Drs. W. M. Court Brown and R. F. Mahler of the Postgraduate Medical School of London, England.

They find that the larger the person, in weight and body surface area, the longer the period after irradiation before acute symptoms of radiation sickness set in. And the longer this period, called the latent period, the shorter is the period of acute symptoms.

Their studies, made on 20 patients getting X-ray treatment for spinal disease, are reported to American scientists in the journal, *Science* (Sept. 4).

Science News Letter, September 19, 1953

## ARCHAEOLOGY

### Man Lived in Alaska Long Before Columbus

► MEN LIVED in Alaska long before the coming of the Eskimos when the climate was much milder than it is at present, the Smithsonian Institution reports.

America's first settlers arrived here from 2,500 to 6,500 years before Columbus. They left behind them in the soil weapons and tools, including arrowheads, knives, skin scrapers, primitive engraving tools and spear points like the ancient Folsom points used by the first-known human occupants of America's Southwest.

These long-buried human belongings have been dated by geological methods by Dr. D. M. Hopkins of the U. S. Geological Survey, who, with the archaeologist Dr. J. L. Giddings, Jr., of the University of Pennsylvania, made a combined study of the Iyatayet Valley on Cape Denbigh, Alaska.

These first Americans lived in Alaska during a warm interval which lasted probably several hundred years. Reading the record in the soil and rocks, Dr. Hopkins found that the warm spell was followed by a long period of bitter cold during which there is no trace of human remains.

Then at a level corresponding to about 50 B.C. they found the handiwork of the first Eskimo people to come to this continent. Later came another Eskimo group who did work very similar to that of the present inhabitants of the Far North.

No trace of human bones was found. But the scientists did come across tiny fragments of charcoal where these early American families gathered around a fire on their hearth possibly 8,000 years ago. For the most part, however, the finds in the bottom layer were mainly flint flakes and chipped stone tools.

It was not possible to tell whether the site of the ancient hearth fires was a permanent homesite or a temporary camp.

Science News Letter, September 19, 1953

## ASTRONOMY

# New Universe Signaled

**Astronomers find that "radio stars" are not stars at all. Some are nebulae and galaxies. Reception of short radio waves from all parts of sky provides research tool.**

**By DR. FRANK J. KERR**  
Australian Radiophysicist

► VAST REGIONS of the heavens are now being explored through a new "window" in our atmosphere.

Astronomers for centuries have used one "window," that of light in the visible or near-visible range, to chart and study the stars. Now they are using radiation in the region of short radio waves to learn things about the universe that were unknown until the radio window was discovered.

Using the short radio waves, new objects were found in the sky—"radio stars"—a puzzle because they could not be matched up with visible objects. It now appears that radio stars are not stars at all, but much bigger things, with a measurable size. Some of these strange objects have been shown to be hazy masses of gas, of the kind which astronomers call nebulae. Others are far-distant galaxies, giant aggregations of stars well outside our Milky Way system.

Karl G. Jansky of Bell Telephone Laboratories, opened up the new science of radio astronomy in 1932, when he found that radio waves are striking the earth from all parts of the sky. The first extensive study of these waves was carried out by Grote Reber in his own backyard. Soon after the war, scientists in Australia and England showed that some of these waves are coming from a few special points in the sky. These became known as "radio stars."

The discovery greatly excited astronomers, who tried to find visible stars or other objects that could be sources of the radio waves. In most cases, however, this could not be done. The radio stars were nowhere near the brightest visible stars, and usually there was no conspicuous objects at all in the region of the radio source.

It appeared that a radio star must be some new type of object in the sky, a body that produces a lot of radio energy, but not much light, or perhaps even no light at all.

## Called "Radio Stars"

Early observations showed that the apparent sizes of the sources were all smaller than a fraction of a degree, but how much smaller could not be determined. Stars are the best-known objects in the sky so the first thought was naturally that the new celestial bodies were stars. Thus the sources were named "radio stars" without any real justification.

When the first attempt to identify the radio stars with the nearest and brightest

visible stars had failed, radio astronomers set to work to make more refined observations and build better—usually bigger—equipment in order to pinpoint the radio stars more accurately.

Soon John G. Bolton of the Radiophysics Laboratory, Sydney, Australia, was able to show that a radio source in the constellation Taurus, the bull, was associated with the Crab Nebula. This hazy object is known to be the remains of a supernova, a star whose violent explosion was witnessed by Chinese astronomers 900 years ago.

Following this first identification, Mr. Bolton found that two radio stars in the constellations of Centaurus, the centaur, and Virgo, the virgin, were very close to external galaxies of an unusual character, and suggested that these were the radio sources.

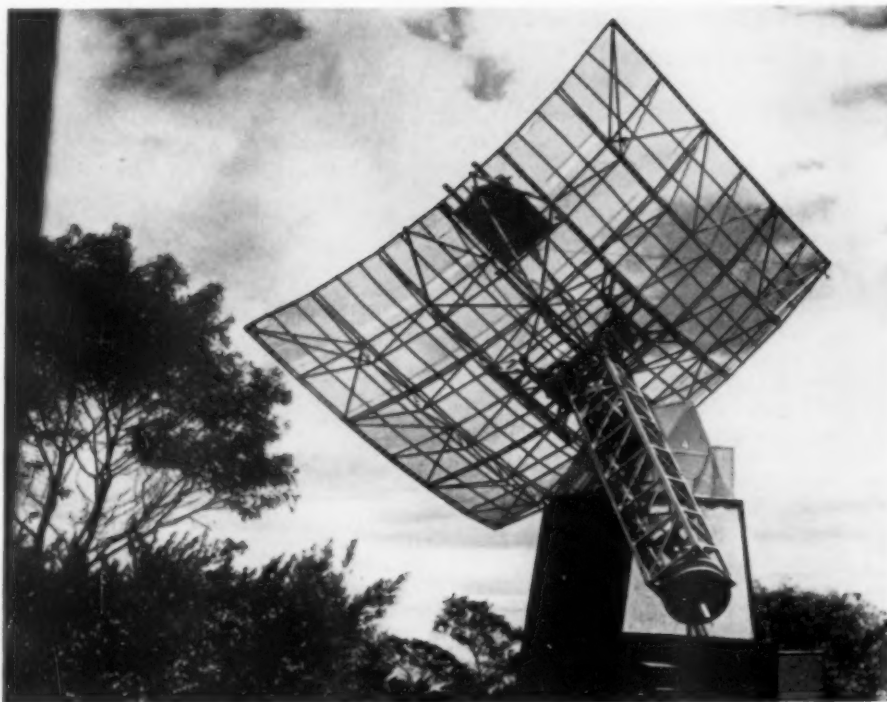
Soon afterwards, Bernard Y. Mills, also of the Radiophysics Laboratory, showed that three sources in other constellations have angular sizes of about half a degree, and therefore must be some kind of nebulae.

Thus there was a lot of evidence that

some kinds of nebulae and galaxies were powerful sources of radio waves, but none pointing to stars or starlike objects. Only a handful of the known radio stars had been identified, however. In particular, the sources in the constellations of Cassiopeia and Cygnus, the swan, which are by far the most powerful of the radio sources, could not be associated with any visible object.

R. Hanbury Brown of the University of Manchester, England, Mr. Mills and Dr. F. G. Smith of Cambridge University, England, have recently, working independently, found it possible to "resolve" the Cygnus source. That is, they have been able to distinguish it from a blurred-out point. The two English scientists have also resolved the Cassiopeia source, which cannot be seen from Australia. Both sources are found to have angular sizes of about one-twentieth of a degree, and must therefore resemble nebulae.

While these radio measurements were being made, Drs. Walter Baade and Rudolph L. Minkowski had been looking in the directions of these radio sources with the 200-inch telescope at Mt. Palomar Observatory, and had found two very interesting objects that were in the right positions and proved to be just about the size obtained in the radio measurements.



**RADIO TELESCOPE**—One of the antennas used by Australian astronomers to catch the radio waves being broadcast from the heavens. The 17-foot square reflector, of parabolic shape, is also used to observe radio noise from the sun.



The radio source in Cygnus is a very unusual galaxy, far beyond our Milky Way system. It appears, in fact, to be two galaxies that have collided with one another.

While the stars of one galaxy are passing through between the stars of the other, the tenuous gas between the stars must be stirred up into violent motion, evidently generating powerful radio waves.

The Cassiopeia source is a hazy and faintly shining nebula. The shape is very irregular and the various parts are apparently moving rapidly. Perhaps it, like the Crab Nebula, is the result of some long-ago explosion. A very similar object has now been seen by Dr. Baade in the constellation Puppis, the stern, in the position of a radio source previously discovered by Mr. Bolton.

Although astronomers cannot yet say with certainty that all radio sources are nebulae, all present evidence points towards that conclusion. Certainly there are no proved radio stars, but there are many proved radio nebulae. Some of these are very distant galaxies of unusual types. Others are nebulae inside our own Milky Way galaxy, vast patches of shining gas, millions of times the size of a star.

#### Doesn't Show Fine Detail

A major difficulty in identifying radio stars with visible objects lies in the fact that a radio telescope, although a very sensitive instrument, is not very good at seeing fine detail. The resolving power of a telescope, either an optical or radio type, is proportional to its diameter. Therefore, the bigger the telescope, the more clearly can it register detail. The resolving power, however, also depends on the wavelength. For visible light the wavelength is very small.

The diameter of an optical telescope is very many times greater than the wavelength, and so the images it produces are sharp and clear. The wavelength of radio waves is a million times greater than that of light, and the diameter of a radio telescope usually contains only a few wavelengths. The resolving power is therefore low. The images are blurred, and the position and size of a radio source cannot be accurately fixed.

For measurements, to settle the question of the size of radio sources, a radio telescope is needed that can resolve sufficiently fine detail. A single antenna would need to be several miles across—clearly impracticable. Work on radio stars is usually done with an interferometer, in which the antenna is split into two separate parts. The resolving power of the system increases as the two parts of the antenna are separated more and more. Systems with antenna separations of several miles have recently been set up.

It is with such antennas that Dr. Smith, Messrs. Mills and Brown, and others are now trying to resolve sizes of other heavenly sources of radio waves.

Science News Letter, September 19, 1953



*The  
"Kinsey Report"  
on women...*

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# Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N. Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**THE AMERICAN FAMILY IN THE TWENTIETH CENTURY**—John Sirjamaki—*Harvard University Press*, 227 p., \$4.25. Results of scholarly investigations of the American family are here brought together for the general reader.

**ANIMAL BIOCHROMES AND STRUCTURAL COLOURS: Physical, Chemical, Distributional and Physiological Features of Coloured Bodies in the Animal World**—Denis L. Fox—*Cambridge University Press*, 379 p., illus., \$11.00. Telling of the strange and beautiful colors in animal life and their importance in comparative physiology.

**AMERICAN CONSTITUTIONAL CUSTOM: A Forgotten Factor in the Founding**—Burleigh Cushing Rodick—*Philosophical Library*, 244 p., \$4.75. Looking into the motives behind the founding of our nation.

**ATOMIC POWER DEVELOPMENT AND PRIVATE ENTERPRISE: Hearings before the Joint Committee on Atomic Energy, Congress of the United States**—*Govt. Printing Office*, 649 p., paper, \$1.50.

**BLIND WHITE FISH IN PERSIA**—Anthony Smith

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—*Dutton*, 256 p., illus., \$3.75. A most readable account of what four young scientists from Oxford found when they toured Persia in a second-hand truck looking for blind white fish that were not there and trying to make friends with a people who thought in ways that were new.

**CONGRESS AND THE CONSTITUTION: Questions and Answers About the Constitution and Government of the United States of America**—Col. Carl Miller—*Exposition Press*, 162 p., \$3.00. Even the well-informed American can learn much about his government from these questions and answers.

**CURRENT BIOLOGICAL RESEARCH IN THE ALASKAN ARCTIC**—Ira L. Wiggins, Ed.—*Stanford University Press*, 55 p., illus., paper, \$1.00. Reporting on research conducted at the Arctic Research Laboratory, Point Barrow, Alaska.

**THE EARTH'S CRUST: A New Approach to Physical Geography and Geology**—L. Dudley Stamp—*Crown*, 120 p., illus., \$5.00. Beautiful colored models show the reader what lies beneath and explains the landscape we all admire.

**THE EASTERN BELTED KINGFISHER IN THE MARITIME PROVINCES**—H. C. White—*Fisheries Research Board of Canada, Bulletin No. 97*, 44 p., illus., paper, 45 cents. In many, and perhaps most cases, kingfishers are harmless to the production of desired species of fish and in some cases may be beneficial.

**HAUNTED HOUSE**—*New York State Department of Mental Hygiene*, 14 p., illus., paper, single copies free upon request direct to publisher, Albany, N. Y. A booklet to help people free themselves from all the fears and needless worries that haunt them.

**A HISTORY OF ASTRONOMY FROM THALES TO KEPLER**—J. L. E. Dreyer—*Dover*, 438 p., illus., paper \$1.95, cloth \$3.95. A new edition of a book long out of print in English.

**AN INTRODUCTON TO RELAXATION METHODS**—F. S. Shaw—*Dover*, 396 p., \$5.50. Aid in solving mathematical problems concerned with fluid mechanics, design of electrical networks, stress distribution and other engineering applications.

**AN INTRODUCTION TO SYMBOLIC LOGIC**—Susanne K. Langer—*Dover*, 2d ed., 367 p., paper \$1.60, cloth \$3.50. In logic, as in mathematics, the author explains, the student has often been taught the techniques and operations without an understanding of the concepts that underlie them. This book is intended to fill this gap.

**LIVING WITH A DISABILITY**—Howard A. Rusk and Eugene J. Taylor—*Blakiston*, 207 p., illus., \$4.00. Practical hints for those for whom such simple commonplace tasks as combing the hair or lacing the shoes present difficult problems. Real help for the handicapped.

**THE MAN IN LEATHER BREECHES: The Life and Times of George Fox**—Vernon Noble—*Philosophical Library*, 298 p., illus., \$6.00. The author, known for his talks on books, sought

for the reason why this sturdy character was so revered and so hated by his contemporaries.

**MANAGEMENT IN THE GRAPHIC ARTS: 1952 Conference Proceedings, Summary of 1951 Conference**—*Carnegie Institute of Technology*, 44 p., paper, \$5.00. Of particular interest to those in the printing industry.

**MEDICAL SCHOOLS IN THE UNITED STATES AT MID-CENTURY**—John E. Deitrick and Robert C. Berson—*McGraw-Hill*, 380 p., illus., \$4.50. The report of the Survey of Medical Education—an evaluation of the medical school, its leadership, functions, activities and finances.

**NEW HOPE FOR THE RETARDED: Enriching the Lives of Exceptional Children**—Morris P. and Miriam Pollock—*Porter Sargent*, 176 p., illus., \$4.50. A book for teachers of special classes and for parents of slow learners to give them a new understanding of the problem and material with which to work.

**SEXUAL BEHAVIOR IN THE HUMAN FEMALE**—Alfred C. Kinsey and others—*Saunders*, 842 p., illus., \$8.00. Sure to be widely talked about. (See SNL, Aug. 22, 1953.)

**SHIPS OF OUR NAVY: Carriers, Battleships, Destroyers and Landing Craft**—C. B. Colby—*Coward-McCann*, 48 p., illus., \$1.00. A photograph of each ship with brief textual description. Telling, too, how the U.S. ships are named.

**A SOBER FAITH: Religion and Alcoholics**—Anonymous—G. Aiken Taylor—*Macmillan*, 108 p., \$2.00. The author, a minister and not an alcoholic, has made a careful study of the contributions of AA and the lessons it has to offer religion.

**THE SPIRIT OF ST. LOUIS**—Charles A. Lindbergh—*Scribner's*, 562 p., illus., \$5.00. A book which has been 14 years in the writing and recreating for you the excitement of that first nonstop crossing of the Atlantic from New York to Paris.

**STAR EXPLORER**—Hugh S. Rice—*Hayden Planetarium*, Revolving disk, cardboard, 50 cents. A chart showing the location of stars and planets for any hour of any night in the year.

**SUBMARINE: Men and Ships of the U. S. Submarine Fleet**—C. B. Colby—*Coward-McCann*, 48 p., illus., \$1.00. A book of excellent photographs and brief descriptive text.

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tures for 1952—George H. T. Kimble—*George Grady Press*, 123 p., \$2.50. The author, who is director of the American Geographical Society, attempts to bring the study of man "down to earth" in the hope that it may kindle in his readers "a warmer affection for this best of all possible worlds."

THE WORKS OF ARCHIMEDES: Edited in Modern Notation With Introductory Chapters—T. L. Heath—*Dover*, 326 p., paper \$1.95, cloth \$4.95. A classical work combined into a single volume for the convenience of students.

Science News Letter, September 19, 1953

#### PLANT PATHOLOGY

### Chemical Treatment Stops Oak Wilt Killing

► SUCCESSFUL CHEMICAL treatment of oak wilt, destructive disease of shade and forest trees that is now spreading in many parts of the nation, has been accomplished.

Dr. Paul F. Hoffman of the Illinois Natural History Survey, reported to the American Institute of the Biological Sciences meeting in Madison, Wis., that eight different chemicals give promise of rescuing seedling and sapling oaks from death. In some experiments, three-quarters of the trees recovered and resumed apparently normal growth. The chemicals seem to change the growth processes of the trees and allow them to live despite the presence of the fungus.

Some of the other advances reported to the biological meetings are:

Disease resistance can be introduced into tomato plants from several wild plant "cousins" collected in South America.—Dr. S. P. Doolittle, U.S. Department of Agriculture.

The age and geographical origin of the large ice islands floating near the North Pole and used as U.S. air bases will be determined by further study of dead plant materials collected from them.—Dr. Nicholas Polunin of Harvard University.

A perennial plague of thousands of acres of beans, called halo blight, can be stopped and cured by water spray containing small amounts of streptomycin.—Dr. William J. Zaunmeyer, U.S. Department of Agriculture.

Perch in lakes reform into schools at about dawn and go into deep water for day-time feeding.—J. J. Tibbles, A. D. Hasler and J. R. Villemont of University of Wisconsin.

Greenhouse watering of chrysanthemums, carnations, roses and other flowering plants by automatically-timed mist spray two minutes out of every six speeds their growth.—Robert W. Langhans, Cornell University.

Bluegills eat six times their own weight in a year.—Prof. Shelby Gerking, Indiana University.

Whitefish in Alaskan lakes store up fat for winter months like bears and other mammals.—Prof. Donald E. Wohlschlag, Stanford University.

Science News Letter, September 19, 1953

#### MEDICINE

### Growth Hormone Fails In Poliomyelitis Test

► HOPE THAT growth hormone from the pituitary gland might be helpful in polio died with studies reported at the meeting of the American Society for Pharmacology and Experimental Therapeutics in New Haven.

Growth hormone was tested because previous studies had shown that ACTH, pituitary hormone famous as an arthritis remedy, could increase the severity of polio. ACTH and growth hormone are antagonis-

tic in certain respects. So Drs. Kenneth W. Cochran and Thomas Francis Jr. of the University of Michigan School of Public Health decided to see whether growth hormone would antagonize naturally produced ACTH and help relieve the severity of polio.

They gave practically pure growth hormone to six monkeys for 12 days. Then these six and six control, untreated monkeys were inoculated with polio virus. All six of the growth-hormone-treated monkeys became paralyzed, and five of the six control monkeys were paralyzed.

Science News Letter, September 19, 1953

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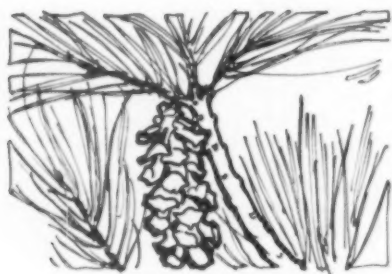
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The White Pine

► IT IS unfortunately true that we have wiped out the major portion of our eastern white pine forests. The original estimated stand of this species in the U. S. was about 600 billion board feet. The present estimated stand is about 15 billion feet.

We should not, however, be too hasty in blaming the lumberman for the decline of

this species. The original white pine was for the most part cut-over by 1870, when white pine, after more than 200 years as the lumber market leader, began to decline. Our eastern hardwoods were also cut heavily, yet they have come back. Why then didn't the pine?

It is quite untrue to say that we did not take the trouble to replant them. Until fairly recently, white pine was the leading species used for reforestation in the East and Lake states, and millions of seedlings were planted. What then are the reasons?

First, on the heavier soils, white pine is a temporary species which was originally established on burns, windthrown areas or cleared areas. Experiments at Harvard Forest proved it was uneconomical to attempt to grow a second crop of pine on heavy soils, since the pine could not compete with the hardwoods that were the normal species. Even on medium soils, expensive weeding is necessary to maintain the type.

Only on lighter soils is white pine a permanent type, and there it has to compete

with blueberries, rhododendron, laurel and other heavy ground cover that often make the establishment of seedlings most difficult.

Insects and disease take their toll. The pales weevil kills young white pine seedlings on newly cut areas. The white pine weevil deforms white pine saplings so as to make them cabbage-shaped and of such low value that most such trees are now used for pulpwood. And there is always the scourge of blister rust threatening the stand.

Eastern white pine is here to stay, although it will never return to its former importance because too many factors are working against it. Scientists in Wisconsin have developed varieties that appear to be resistant to blister rust. Lumbermen are learning how to grow white pine in mixed stands with other species.

The great, pure white pine stands are for the most part gone, and they will not return unless we find an effective means of combating the tree's enemies. Even then, we shall be successful only on the lighter and medium soils.

Science News Letter, September 19, 1953

## METEOROLOGY

## Ice Cause of Lightning

► THE POWERFUL flashes of lightning are associated with the growth of ice pellets or soft hail of thunderstorms.

This new theory on the generation of electricity in thunderclouds was put forward to the British Association for the Advancement of Science meeting in Liverpool by Dr. B. J. Mason of Imperial College, London.

No existing theory has heretofore explained satisfactorily the mechanism by which electric charge in thunderclouds is generated and separated into positive and negative regions in the upper and lower parts of cloud. Between 500 and 1,000 coulombs of charge has to be built up before the first flash and it has to be manufactured in less than 20 minutes. No theory explains the building up of the required quantity of charge in the time available.

Dr. Mason has observed that when ice pellets are manufactured artificially they acquire a negative charge. The compensating positive charge is communicated to the air when ice pellets grow. In a thundercloud, they fall relative to the air and carry negative charge downwards, while the positive charge is carried to the top of the cloud, either on ions (charged atoms), small cloud droplets or small ice crystals, to give correct charge distribution. Dr. Mason has calculated the growth of these particles in thunderstorms in terms of temperature, water content, speed of up-current, and he has used the results of his experiments to calculate their charge.

This mechanism can provide between 500 and 1,000 coulombs of charge in a

radius of two kilometers (little over a mile) within one and a half minutes of initiation of ice crystals.

Science News Letter, September 19, 1953

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## PSYCHOLOGY

# "Synthetic" Anger

► THE SUGGESTION, given under hypnosis, that the individual would feel "very angry, hostile and aggressive" toward the examiner actually showed up in the hypnotized person's later performance on a personality test.

This was found in experiments conducted by Dr. Frank A. Pattie at the University of Kentucky and reported to the American Psychological Association in Cleveland.

When presented with the Rorschach ink-blot cards and asked to tell what they saw in the odd shaped daubs, some of these synthetically angry persons pushed away the cards and refused to take part. Those who did go along with the examiner saw in the blots such things as guns, fierce animals and other objects of violence. Only a few failed to display anger in either of these ways.

Some of the individuals had been asked what effect they thought hostility would have on the Rorschach test. The responses of these persons when given the test fitted in with what they had predicted. Those who believed it would have no effect gave the same responses as usual.

The Rorschach personality test also shows how a patient taking psychiatric treatment grows to be more like his doctor. Seventeen out of 21 patients studied had Rorschach scores more and more like those of their doctor while only four became more unlike him. Patients rated by their doctors as improving most with treatment showed the greater change to resemble the doctor.

Science News Letter, September 19, 1953

## PSYCHOLOGY

## Highway Accidents Due To Animals Not There

► MANY A serious highway accident is caused when a truck driver suddenly swerves or jams on his brakes to avoid hitting a little animal that is really not there.

This was found when psychologists looked into the causes for accidents to long-distance truck drivers. The findings were reported to the American Psychological Association, meeting in Cleveland, by Dr. Alfred L. Moseley of the Harvard School of Public Health.

Just what causes the drivers to "see things" in their path was not found, but it happens when the driver is sleepy, usually at night and always on long distance runs. It is not until the truck has come to a screeching stop that the driver begins to realize that the animal may be imaginary.

Science News Letter, September 19, 1953

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## QUESTIONS

ASTRONOMY—What so-called stars are not stars at all? p. 186.

BACTERIOLOGY—Of what crime is the violet germ found guilty? p. 183.

BOTANY—Of what use are pollen-sterile plants? p. 181.

CHEMISTRY—What materials can plastics be made from in the future? p. 179.

GENETICS—What do chromosomes look like? p. 178.

MEDICINE—How can clots in the heart's arteries be dissolved? p. 182.

What hope is there of cure of now incurable diseases? p. 180.

PHYSIOLOGY—What chemicals spur the body's protective mechanisms? p. 178.

Photographs: Cover, University of California; p. 179, Chicago Natural History Museum; p. 181, Fremont Davis; p. 183, Woods Hole Oceanographic Institution; p. 186, Dr. Frank J. Kerr; p. 192, Johnson Motors.

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❁ **ANTI-FIRE PAINT** helps stop blazes from spreading by exuding carbon dioxide and calcium chloride when fire licks surfaces coated with it. These chemicals produce a smothering action by choking off the fire's oxygen supply. The fire-retardant interior oil paint is said to be suitable for industrial use and may find applications aboard ships.

Science News Letter, September 19, 1953

❁ **MAGNIFYING LENSES** have been created for welders who wear bifocal glasses. The lenses fit standard protective helmets and are inserted between the regular helmet filter lens and the rear cover plate. The magnifying element of ordinary bifocal glasses usually is out of the line of vision when the helmet is in working position.

Science News Letter, September 19, 1953

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